FIG. 1

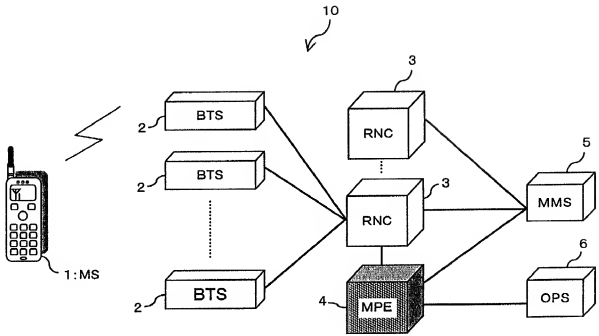

FIG. 2

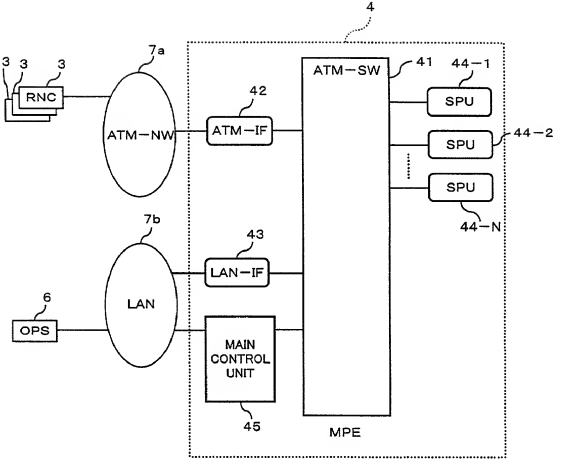
4
3
3
3
RNC
7a
ATM−NW
42
ATM−IF
ATM−SW
41
44−1
SPU
SPU
44−2
SPU
44−N
7b
43
LAN−IF
6
OPS
LAN
MAIN
CONTROL
UNIT
45
MPE

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FIG. 3

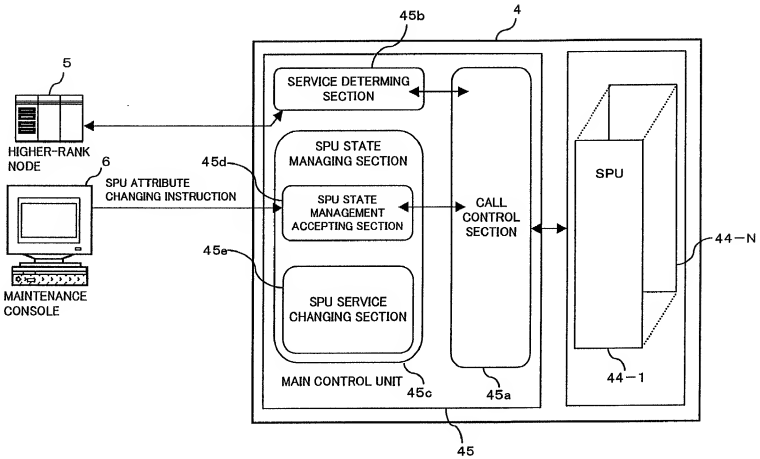

FIG. 4

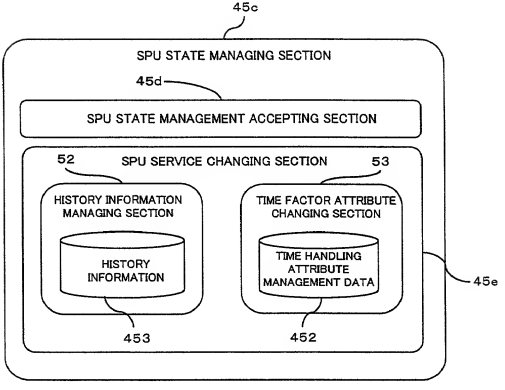
45c
SPU STATE MANAGING SECTION
45d
SPU STATE MANAGEMENT ACCEPTING SECTION
52
SPU SERVICE CHANGING SECTION
53
HISTORY INFORMATION MANAGING SECTION
TIME FACTOR ATTRIBUTE CHANGING SECTION
HISTORY INFORMATION
TIME HANDLING ATTRIBUTE MANAGEMENT DATA
45e
453
452

FIG. 5A

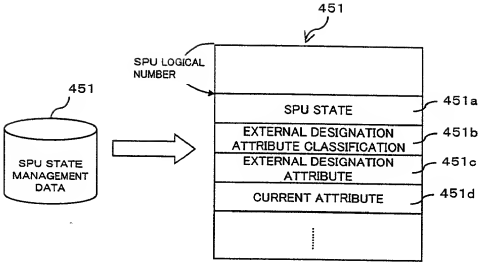
451
SPU LOGICAL NUMBER
451
SPU STATE MANAGEMENT DATA
SPU STATE
EXTERNAL DESIGNATION ATTRIBUTE CLASSIFICATION
EXTERNAL DESIGNATION ATTRIBUTE
CURRENT ATTRIBUTE
451a
451b
451c
451d

FIG. 5B

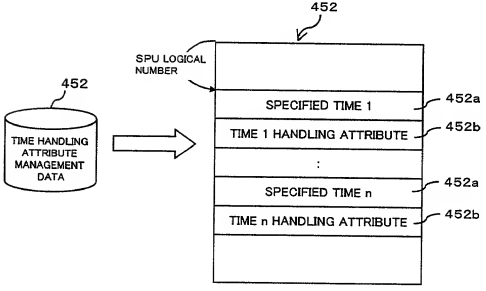
452
SPU LOGICAL NUMBER
452
TIME HANDLING ATTRIBUTE MANAGEMENT DATA
SPECIFIED TIME 1
TIME 1 HANDLING ATTRIBUTE
SPECIFIED TIME n
TIME n HANDLING ATTRIBUTE
452a
452b
452a
452b

FIG. 6

453

SPU LOGICAL NUMBER	EXTERNAL DESIGNATION ATTRIBUTE	SPECIFIED TIME																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
		0:00 ~ 1:00	1:00 ~ 2:00	2:00 ~ 3:00	3:00 ~ 4:00	4:00 ~ 5:00	5:00 ~ 6:00	6:00 ~ 7:00	7:00 ~ 8:00	8:00 ~ 9:00	9:00 ~ 10:00	10:00 ~ 11:00	11:00 ~ 12:00	12:00 ~ 13:00	13:00 ~ 14:00	14:00 ~ 15:00	15:00 ~ 16:00	16:00 ~ 17:00	17:00 ~ 18:00	18:00 ~ 19:00	19:00 ~ 20:00	20:00 ~ 21:00	21:00 ~ 22:00	22:00 ~ 23:00	23:00 ~ 0:00
1	1:VOICE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2:ISDN	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3:PACKET	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4:PIAFS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5:FAX	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6:MODEM	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7:PPP	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	0:NO DESIGNATION	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	0:NO DESIGNATION	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	0:NO DESIGNATION	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	0
11	0:NO DESIGNATION	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0
12	0:NO DESIGNATION	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0
13	0:NO DESIGNATION	2	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	0:NO DESIGNATION	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	0	0	0	0	0
15	0:NO DESIGNATION	0	0	0	0	0	0	0	0	2	2	2	2	0	2	2	2	2	2	0	0	0	0	0	0
16	0:NO DESIGNATION	0	0	0	0	0	0	0	0	2	2	2	2	0	2	2	2	2	2	0	0	0	0	0	0
17	0:NO DESIGNATION	3	0	0	0	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	0:NO DESIGNATION	0	0	0	0	0	0	0	0	3	3	3	3	0	3	3	3	3	3	0	0	0	0	0	0
19	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0
20	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0
21	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0
22	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	2	2	2	0	1	0	0	0	0	0	0	0	0	0	0
23	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	2	2	2	0	1	0	0	0	0	0	0	0	0	0	0
24	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
25	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
26	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0:NO DESIGNATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	SPARE PKG																								
32	SPARE PKG																								

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FIG. 7

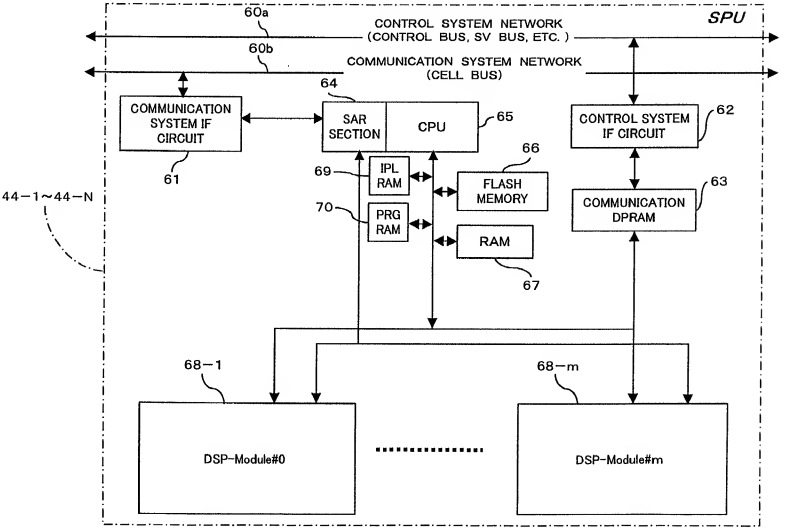

FIG. 8

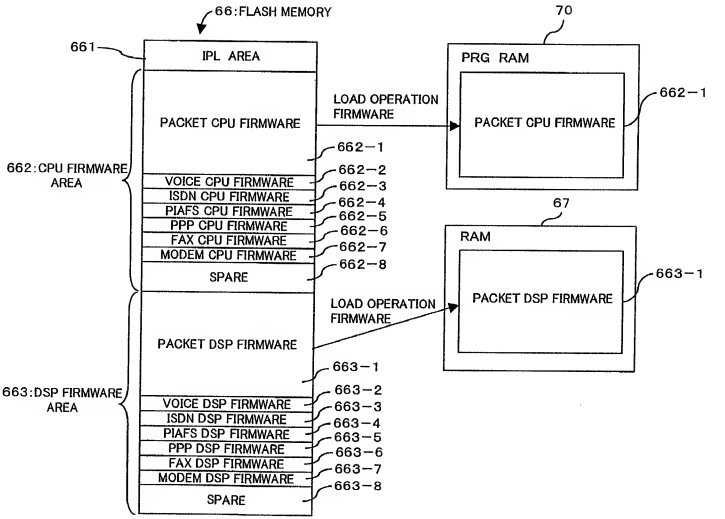
66:FLASH MEMORY
70
661
IPL AREA
PRG RAM
LOAD OPERATION FIRMWARE
PACKET CPU FIRMWARE
662-1
662:CPU FIRMWARE AREA
VOICE CPU FIRMWARE
662-2
ISDN CPU FIRMWARE
662-3
PIAFS CPU FIRMWARE
662-4
PPP CPU FIRMWARE
662-5
FAX CPU FIRMWARE
662-6
MODEM CPU FIRMWARE
662-7
SPARE
662-8
67
RAM
663-1
LOAD OPERATION FIRMWARE
PACKET DSP FIRMWARE
663-1
663:DSP FIRMWARE AREA
VOICE DSP FIRMWARE
663-2
ISDN DSP FIRMWARE
663-3
PIAFS DSP FIRMWARE
663-4
PPP DSP FIRMWARE
663-5
FAX DSP FIRMWARE
663-6
MODEM DSP FIRMWARE
663-7
SPARE
663-8

FIG. 9

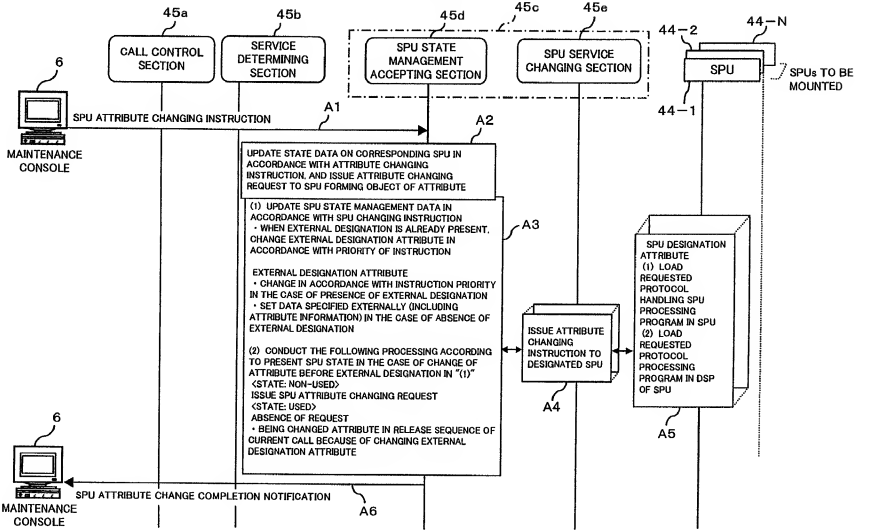
45a
45b
45d
45c
45e
CALL CONTROL SECTION
SERVICE DETERMINING SECTION
SPU STATE MANAGEMENT ACCEPTING SECTION
SPU SERVICE CHANGING SECTION
44-2
44-N
SPU
SPUs TO BE MOUNTED
44-1
6
MAINTENANCE CONSOLE
SPU ATTRIBUTE CHANGING INSTRUCTION
A1
A2
UPDATE STATE DATA ON CORRESPONDING SPU IN ACCORDANCE WITH ATTRIBUTE CHANGING INSTRUCTION, AND ISSUE ATTRIBUTE CHANGING REQUEST TO SPU FORMING OBJECT OF ATTRIBUTE
(1) UPDATE SPU STATE MANAGEMENT DATA IN ACCORDANCE WITH SPU CHANGING INSTRUCTION
・WHEN EXTERNAL DESIGNATION IS ALREADY PRESENT, CHANGE EXTERNAL DESIGNATION ATTRIBUTE IN ACCORDANCE WITH PRIORITY OF INSTRUCTION
EXTERNAL DESIGNATION ATTRIBUTE
・CHANGE IN ACCORDANCE WITH INSTRUCTION PRIORITY IN THE CASE OF PRESENCE OF EXTERNAL DESIGNATION
・SET DATA SPECIFIED EXTERNALLY (INCLUDING ATTRIBUTE INFORMATION) IN THE CASE OF ABSENCE OF EXTERNAL DESIGNATION
(2) CONDUCT THE FOLLOWING PROCESSING ACCORDING TO PRESENT SPU STATE IN THE CASE OF CHANGE OF ATTRIBUTE BEFORE EXTERNAL DESIGNATION IN "(1)"
<STATE: NON-USED>
ISSUE SPU ATTRIBUTE CHANGING REQUEST
<STATE: USED>
ABSENCE OF REQUEST
・BEING CHANGED ATTRIBUTE IN RELEASE SEQUENCE OF CURRENT CALL BECAUSE OF CHANGING EXTERNAL DESIGNATION ATTRIBUTE
A3
ISSUE ATTRIBUTE CHANGING INSTRUCTION TO DESIGNATED SPU
A4
SPU DESIGNATION ATTRIBUTE
(1) LOAD REQUESTED PROTOCOL HANDLING SPU PROCESSING PROGRAM IN SPU
(2) LOAD REQUESTED PROTOCOL PROCESSING PROGRAM IN DSP OF SPU
A5
6
MAINTENANCE CONSOLE
SPU ATTRIBUTE CHANGE COMPLETION NOTIFICATION
A6

FIG. 10

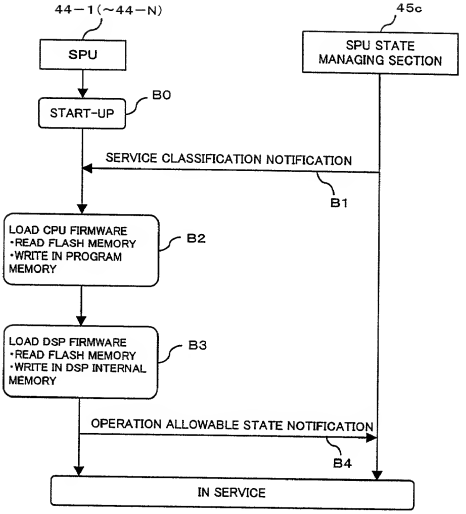
44−1(~44−N)
SPU
45c
SPU STATE MANAGING SECTION
START-UP
B0
SERVICE CLASSIFICATION NOTIFICATION
B1
LOAD CPU FIRMWARE
•READ FLASH MEMORY
•WRITE IN PROGRAM MEMORY
B2
LOAD DSP FIRMWARE
•READ FLASH MEMORY
•WRITE IN DSP INTERNAL MEMORY
B3
OPERATION ALLOWABLE STATE NOTIFICATION
B4
IN SERVICE

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FIG. 11

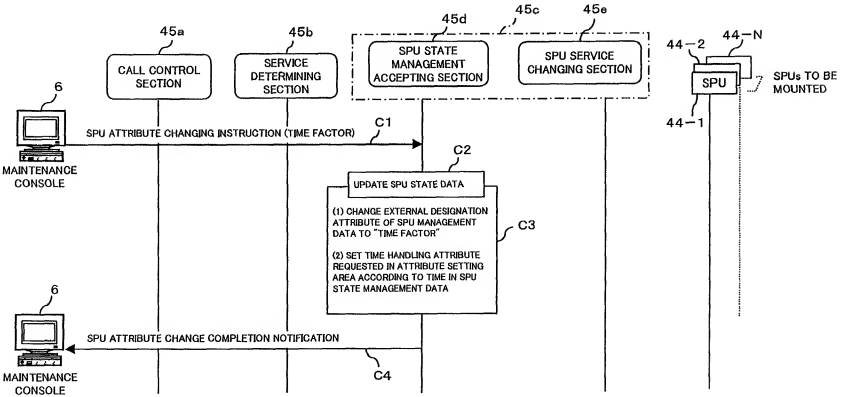

FIG. 12

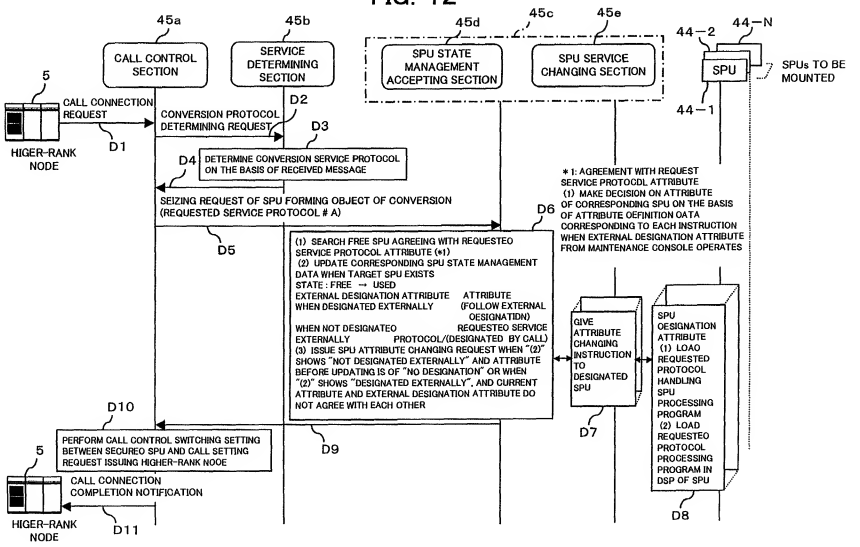
45a
CALL CONTROL SECTION
45b
SERVICE DETERMINING SECTION
45d
SPU STATE MANAGEMENT ACCEPTING SECTION
45c
45e
SPU SERVICE CHANGING SECTION
44—2
44—N
SPU
SPUs TO BE MOUNTED
44—1
5
CALL CONNECTION REQUEST
D1
CONVERSION PROTOCOL DETERMINING REQUEST
D2
D3
HIGER-RANK NODE
D4
DETERMINE CONVERSION SERVICE PROTOCOL ON THE BASIS OF RECEIVED MESSAGE
SEIZING REQUEST OF SPU FORMING OBJECT OF CONVERSION (REQUESTED SERVICE PROTOCOL # A)
D5
D6
(1) SEARCH FREE SPU AGREEING WITH REQUESTEO SERVICE PROTOCOL ATTRIBUTE (※1)
(2) UPDATE CORRESPONDING SPU STATE MANAGEMENT DATA WHEN TARGET SPU EXISTS
STATE : FREE → USED
EXTERNAL DESIGNATION ATTRIBUTE WHEN DESIGNATED EXTERNALLY ATTRIBUTE (FOLLOW EXTERNAL OESIGNATIDN)
WHEN NOT DESIGNATEO EXTERNALLY REQUESTEO SERVICE PROTOCOL /(DESIGNATED BY CALL)
(3) ISSUE SPU ATTRIBUTE CHANGING REQUEST WHEN "(2)" SHOWS "NOT DESIGNATED EXTERNALLY" AND ATTRIBUTE BEFORE UPDATING IS OF "NO DESIGNATION" OR WHEN "(2)" SHOWS "DESIGNATED EXTERNALLY", AND CURRENT ATTRIBUTE AND EXTERNAL DESIGNATION ATTRIBUTE DO NOT AGREE WITH EACH OTHER
※1: AGREEMENT WITH REQUEST SERVICE PROTOCOL ATTRIBUTE
(1) MAKE DECISION ON ATTRIBUTE OF CORRESPONDING SPU ON THE BASIS OF ATTRIBUTE OEFINITION OATA CORRESPONDING TO EACH INSTRUCTION WHEN EXTERNAL DESIGNATION ATTRIBUTE FROM MAINTENANCE CONSOLE OPERATES
GIVE ATTRIBUTE CHANGING INSTRUCTION TO DESIGNATED SPU
D7
SPU OESIGNATION ATTRIBUTE (1) LOAD REQUESTED PROTOCOL HANDLING SPU PROCESSING PROGRAM (2) LOAD REQUESTEO PROTOCOL PROCESSING PROGRAM IN DSP OF SPU
D8
D10
PERFORM CALL CONTROL SWITCHING SETTING BETWEEN SECUREO SPU AND CALL SETTING REQUEST ISSUING HIGHER-RANK NOOE
D9
5
CALL CONNECTION COMPLETION NOTIFICATION
HIGER-RANK NODE
D11

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FIG. 13

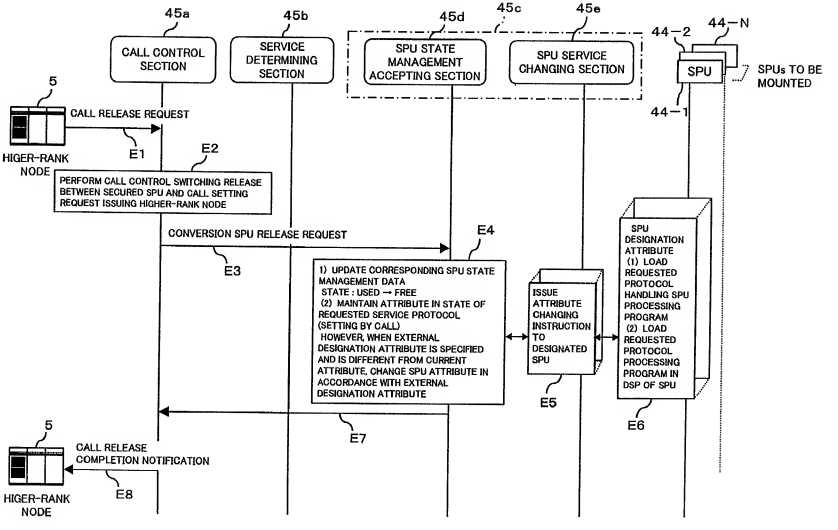

FIG. 14

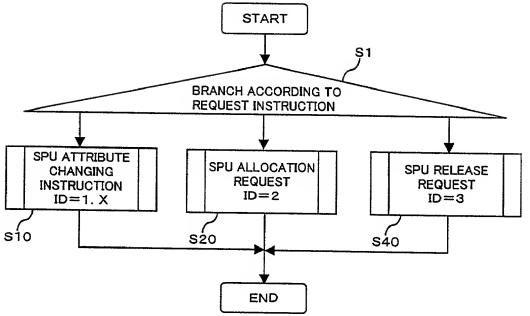
START
S1
BRANCH ACCORDING TO REQUEST INSTRUCTION
SPU ATTRIBUTE CHANGING INSTRUCTION ID=1, X
SPU ALLOCATION REQUEST ID=2
SPU RELEASE REQUEST ID=3
S10
S20
S40
END

FIG. 15

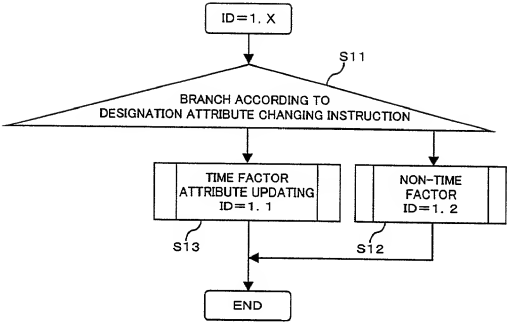
ID=1. X
S11
BRANCH ACCORDING TO
DESIGNATION ATTRIBUTE CHANGING INSTRUCTION
TIME FACTOR
ATTRIBUTE UPDATING
ID=1. 1
NON-TIME
FACTOR
ID=1. 2
S13
S12
END

FIG. 16

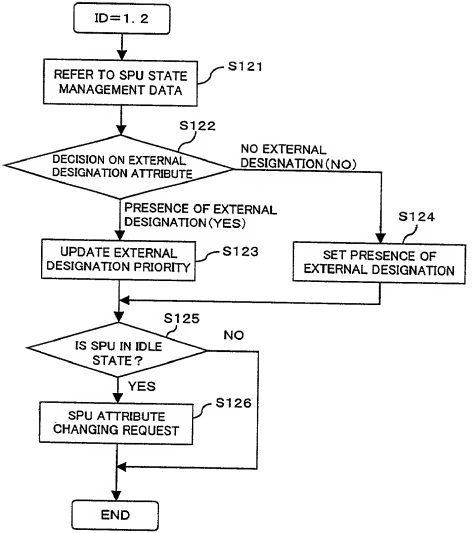
ID=1. 2
REFER TO SPU STATE MANAGEMENT DATA
S121
S122
DECISION ON EXTERNAL DESIGNATION ATTRIBUTE
NO EXTERNAL DESIGNATION (NO)
PRESENCE OF EXTERNAL DESIGNATION (YES)
S124
UPDATE EXTERNAL DESIGNATION PRIORITY
S123
SET PRESENCE OF EXTERNAL DESIGNATION
S125
IS SPU IN IDLE STATE?
NO
YES
SPU ATTRIBUTE CHANGING REQUEST
S126
END

FIG. 17

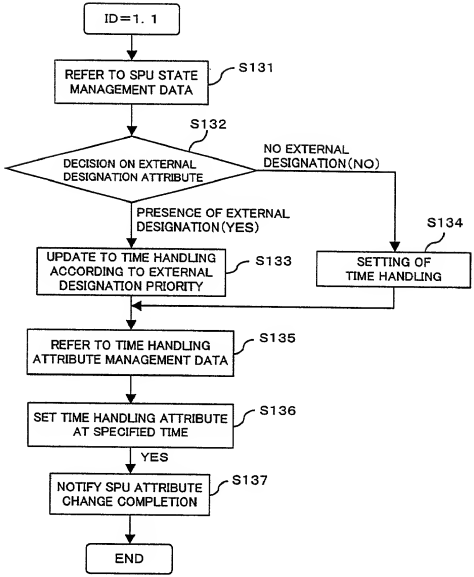
ID=1. 1
REFER TO SPU STATE MANAGEMENT DATA
S131
S132
DECISION ON EXTERNAL DESIGNATION ATTRIBUTE
NO EXTERNAL DESIGNATION(NO)
PRESENCE OF EXTERNAL DESIGNATION(YES)
S134
UPDATE TO TIME HANDLING ACCORDING TO EXTERNAL DESIGNATION PRIORITY
S133
SETTING OF TIME HANDLING
REFER TO TIME HANDLING ATTRIBUTE MANAGEMENT DATA
S135
SET TIME HANDLING ATTRIBUTE AT SPECIFIED TIME
S136
YES
NOTIFY SPU ATTRIBUTE CHANGE COMPLETION
S137
END

FIG. 18

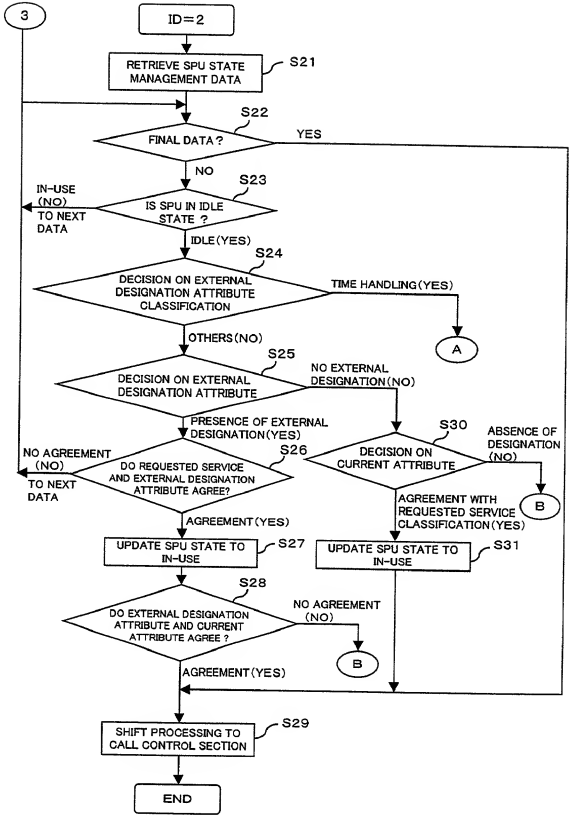
3
ID=2
RETRIEVE SPU STATE MANAGEMENT DATA
S21
FINAL DATA ?
S22
YES
NO
IS SPU IN IDLE STATE ?
S23
IN-USE (NO)
TO NEXT DATA
IDLE (YES)
DECISION ON EXTERNAL DESIGNATION ATTRIBUTE CLASSIFICATION
S24
TIME HANDLING (YES)
A
OTHERS (NO)
DECISION ON EXTERNAL DESIGNATION ATTRIBUTE
S25
NO EXTERNAL DESIGNATION (NO)
PRESENCE OF EXTERNAL DESIGNATION (YES)
DO REQUESTED SERVICE AND EXTERNAL DESIGNATION ATTRIBUTE AGREE?
S26
NO AGREEMENT (NO)
TO NEXT DATA
AGREEMENT (YES)
DECISION ON CURRENT ATTRIBUTE
S30
ABSENCE OF DESIGNATION (NO)
AGREEMENT WITH REQUESTED SERVICE CLASSIFICATION (YES)
B
UPDATE SPU STATE TO IN-USE
S27
UPDATE SPU STATE TO IN-USE
S31
DO EXTERNAL DESIGNATION ATTRIBUTE AND CURRENT ATTRIBUTE AGREE ?
S28
NO AGREEMENT (NO)
B
AGREEMENT (YES)
SHIFT PROCESSING TO CALL CONTROL SECTION
S29
END

FIG. 19

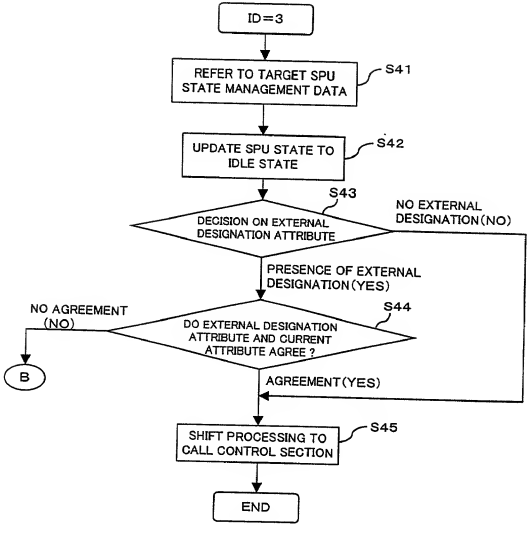
ID=3
REFER TO TARGET SPU STATE MANAGEMENT DATA
S41
UPDATE SPU STATE TO IDLE STATE
S42
S43
DECISION ON EXTERNAL DESIGNATION ATTRIBUTE
NO EXTERNAL DESIGNATION(NO)
PRESENCE OF EXTERNAL DESIGNATION(YES)
NO AGREEMENT (NO)
S44
DO EXTERNAL DESIGNATION ATTRIBUTE AND CURRENT ATTRIBUTE AGREE ?
B
AGREEMENT(YES)
SHIFT PROCESSING TO CALL CONTROL SECTION
S45
END

FIG. 20

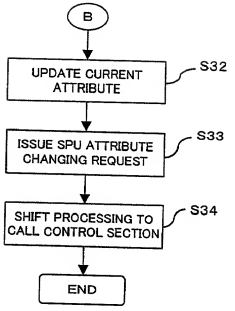

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FIG. 21

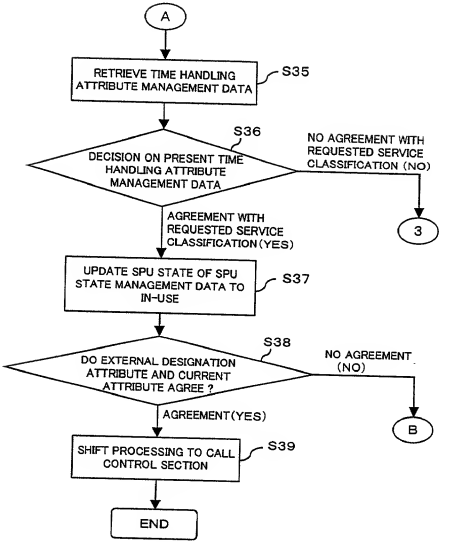
A
RETRIEVE TIME HANDLING ATTRIBUTE MANAGEMENT DATA
S35
S36
DECISION ON PRESENT TIME HANDLING ATTRIBUTE MANAGEMENT DATA
NO AGREEMENT WITH REQUESTED SERVICE CLASSIFICATION (NO)
3
AGREEMENT WITH REQUESTED SERVICE CLASSIFICATION (YES)
UPDATE SPU STATE OF SPU STATE MANAGEMENT DATA TO IN-USE
S37
S38
DO EXTERNAL DESIGNATION ATTRIBUTE AND CURRENT ATTRIBUTE AGREE ?
NO AGREEMENT (NO)
B
AGREEMENT (YES)
SHIFT PROCESSING TO CALL CONTROL SECTION
S39
END

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FIG. 22A

EXTERNAL DESIGNATION ATTRIBUTE SET PREVIOUSLY
EXAMPLE (PREVIOUS DESIGNATION IS KEPT TO A MINIMUM, AND OTHER DESIGNATION IS HANDLED IN REAL TIME IN OPERATION)

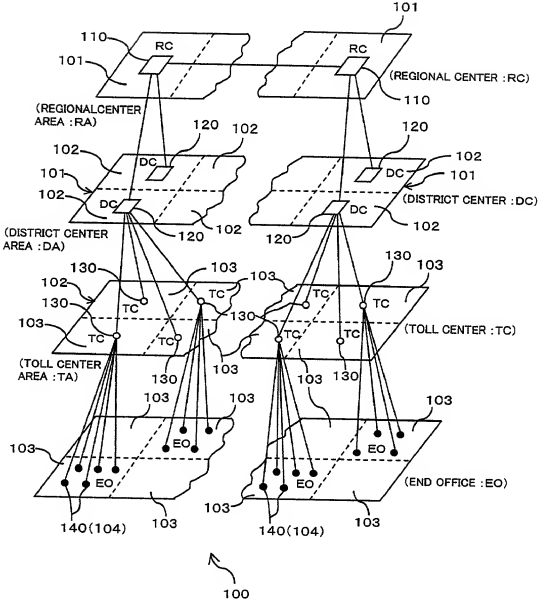
SPU LOGICAL NUMBER	EXTERNAL DESIGNATION ATTRIBUTE
1	1:VOICE
2	2:ISDN
3	3:PACKET
4	4:PIAFS
5	5:FAX
6	6:MODEM
7	7:PPP
8	0:NO DESIGNATION
9	0:NO DESIGNATION
10	0:NO DESIGNATION
11	0:NO DESIGNATION
12	0:NO DESIGNATION
13	0:NO DESIGNATION
14	0:NO DESIGNATION
15	0:NO DESIGNATION
16	0:NO DESIGNATION
17	0:NO DESIGNATION
18	0:NO DESIGNATION
19	0:NO DESIGNATION
20	0:NO DESIGNATION
21	0:NO DESIGNATION
22	0:NO DESIGNATION
23	0:NO DESIGNATION
24	0:NO DESIGNATION
25	0:NO DESIGNATION
26	0:NO DESIGNATION
27	0:NO DESIGNATION
28	0:NO DESIGNATION
29	0:NO DESIGNATION
30	0:NO DESIGNATION
31	SPARE PKG
32	SPARE PKG

FIG. 22B

EXTERNAL DESIGNATION ATTRIBUTE SET PREVIOUSLY EXAMPLE (RATIO OF SERVICES PREDICATABLE PREVIOUSLY IS RESERVED)

SPU LOGICAL NUMBER	EXTERNAL DESIGNATION ATTRIBUTE
1	1:VOICE
2	1:VOICE
3	1:VOICE
4	1:VOICE
5	1:VOICE
6	2:ISDN
7	2:ISDN
8	2:ISDN
9	2:ISDN
10	2:ISDN
11	3:PACKET
12	3:PACKET
13	3:PACKET
14	3:PACKET
15	3:PACKET
16	4:PIAFS
17	4:PIAFS
18	5:FAX
19	5:FAX
20	6:MODEM
21	6:MODEM
22	7:PPP
23	7:PPP
24	0:NO DESIGNATION
25	0:NO DESIGNATION
26	0:NO DESIGNATION
27	0:NO DESIGNATION
28	0:NO DESIGNATION
29	0:NO DESIGNATION
30	0:NO DESIGNATION
31	SPARE PKG
32	SPARE PKG

FIG. 23
RELATED ART



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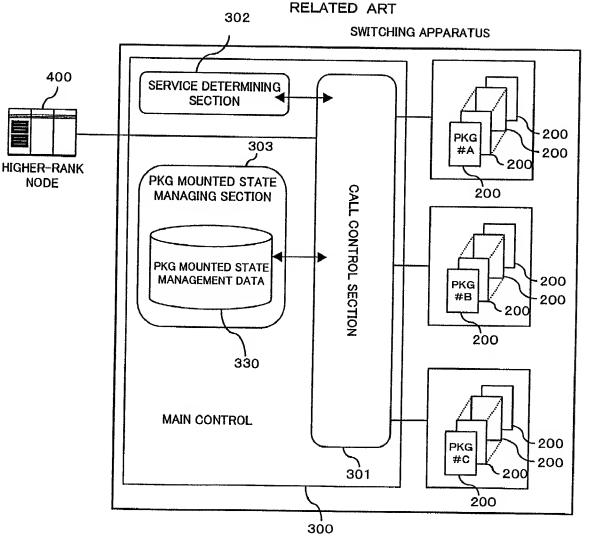
FIG. 24
RELATED ART